WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2005NC45B

Title: Estuarine sediment beds as a reservoir for human pathogens: monitoring transport of populations of enterococci and Vibrio in the Neuse River Estuary

Project Type: Research

Focus Categories: Sediments, Ecology, Surface Water

Keywords: suspended sediments, sedimentation, water quality monitoring, river beds, estuaries, contaminant transport, bacteria

Start Date: 03/01/2005

End Date: 02/28/2006

Federal Funds: $18,137

Non-Federal Matching Funds: $36,273

Congressional District: 3

Principal Investigators:
Rachel T. Noble

Stephen Fries

Abstract

The Neuse River Estuary represents a critical ecological and economic resource to the residents of eastern North Carolina. One of the dangers to the health of the ecosystem and the populations near it is the possibility of introduced bacterial pathogens. This study endeavors to determine the possibility that populations of two pathogenic groups, enterococci and Vibrio, may deposit and remain viable in estuarine sediments. These organisms would remain a potential source for contamination under conditions of mixing and sediment erosion, even when there are no inputs from runoff or anthropogenic sources. This work will entail a regular sampling campaign from small boats for water and sediment cores, coupled with automated sampling of the bottom water to obtain samples under weather conditions that restrict marine operations. Factors that may influence the viability of these organisms, such as sediment organic content, temperature, salinity, and particle size distribution will be assessed in the hopes of characterizing environments that are likely to host these organisms for future return to the water column. The results of this study will likely play an important role in pathogen transport models

by quantifying the sediment bed as a potential reservoir and source for organisms, improving predictions, and enabling managers to make better predictions of health risks to the local populations.